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## UNITARY MULTI-USE ALIGNMENT FIXTURE FOR SHOE PRODUCTION

### CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application No. 61/194,300, filed Sep. 26, 2008, entitled "Unitary Multi-Use Alignment Fixture for Shoe Production."

### BACKGROUND OF THE INVENTION

One skilled in the relevant art will appreciate that shoe manufacturing involves many processes, some of which are independent from each other, and others that are dependent on each other. Within each process comes variation from one shoe to another. Variation even exists as a shoe or a portion of a shoe is moved from one process to another based on, for example, the shoe portions not being aligned relative to one another, and relative to the machine performing the process. These processes may include, for example, printing, laser, embroidery, stitching, forming, and the like. Variation is likely to occur because operator interaction is required, and therefore skill and craftsmanship of the operator dictates the final result of a shoe portion, such as the upper portion of a shoe. Operator interaction may be involved within specific processes, such as those listed above, or even moving a shoe portion from one process to the next. Variation is inevitable when a certain amount of operator interaction is involved. Further, shoe manufacturing processes on the upper portion of a shoe, for example, typically occur when the upper portion has been shaped, or is three-dimensional, as opposed to being flat or two-dimensional. In some cases, this may decrease the efficiency of the customization, forming, and stitching of the upper portion.

### SUMMARY OF THE INVENTION

This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

The present invention is directed toward an alignment fixture that may be used to substantially remove variation in a shoe manufacturing process by minimizing operation interaction with the shoe or shoe portions, thus providing for the ability to predict the quality of shoe portions after each process has been performed. More particularly, the alignment fixture may be used in the shoe manufacturing process to move portions of a shoe through various processes, such as printing, laser, and embroidery, in addition to any other customization processes that may take place. Further, once customization has been completed, the alignment fixture may move the shoe portion to processes such as forming, stitching, and final trimming. The alignment fixture has a significant advantage in that it keeps the shoe portion completely flat throughout the processes mentioned above, which also allows for minimal operator interaction.

### BRIEF DESCRIPTION OF THE DRAWING

The present invention is described in detail below with reference to the attached drawing figures, wherein:

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FIG. 1 illustrates a system for manufacturing shoes including a plurality of pieces of manufacturing equipment and an alignment gauge that can be mounted to each of the individual pieces of manufacturing equipment;

FIG. 2 illustrates a perspective view of an alignment fixture for aligning and stabilizing a shoe portion throughout a shoe customization process, in accordance with an embodiment of the present invention;

FIG. 3 illustrates an enlarged perspective view of an alignment gauge comprising a first plate and a second plate between which a shoe portion is secured, in accordance with an embodiment of the present invention;

FIG. 4 illustrates a perspective view of an alignment fixture for use in forming a shoe portion, in accordance with an embodiment of the present invention;

FIG. 5 illustrates an enlarged perspective view of an alignment mounting member that may be secured to an alignment gauge, in accordance with an embodiment of the present invention;

FIG. 6 illustrates a perspective view of an alignment mounting member secured to an alignment gauge for use in a shoe manufacturing process, in accordance with an embodiment of the present invention;

FIG. 7 illustrates an alignment fixture used to cold press a vamp portion of a shoe, in accordance with an embodiment of the present invention;

FIG. 8 illustrates an alignment fixture used to perform final trimming on a vamp portion of a shoe, in accordance with an embodiment of the present invention;

FIG. 9 illustrates an alignment fixture used to form a vamp portion of a shoe, in accordance with an embodiment of the present invention;

FIG. 10 illustrates an alignment fixture used to form a tongue portion of a shoe, in accordance with an embodiment of the present invention;

FIG. 11 illustrates a tongue trimming system, in accordance with an embodiment of the present invention;

FIG. 12 illustrates a tongue trimming system for a left and a right shoe, in accordance with an embodiment of the present invention; and

FIG. 13 illustrates a series of processes, including cold pressing, forming, and trimming of a vamp portion of a shoe, in accordance with an embodiment of the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

The subject matter of the present invention is described with specificity herein to meet statutory requirements. However, the description itself is not intended to limit the scope of this patent. Rather, the inventors have contemplated that the claimed subject matter might also be embodied in other ways, to include different steps or combinations of steps similar to the ones described in this document, in conjunction with other present or future technologies.

Embodiments of the invention provide for an alignment fixture that may be used to align and stabilize various portions of a shoe during a shoe manufacturing process, ensuring that the finished product is reproducible, thus substantially eliminating variation in the finished product. In one instance, a manufacturing process may, in some embodiments, include the individual manufacture of an outsole, a midsole, and an upper portion that, when combined, form a completed shoe. The alignment fixture, in one embodiment, may be used in the manufacture of the upper portion of a shoe, and more particularly, may be used to move the upper portion between various processes that are performed. By way of example only and not limitation, the alignment fixture may be utilized during pro-